

September 11, 1998

To: Members of the Bay Delta Advisory Council

From: Ad Hoc Delta Group, Including: Margit Aramburu, Executive Director, Delta Protection Commission; John Cain, Environmental Planner, Natural Heritage Institute; Tom Zuckerman, Co-Counsel, Central Delta Water Agency

Subject: Alternative Proposal for CALFED Ecosystem Restoration Program in the Delta

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**BACKGROUND:**

In the Delta Protection Commission's comment letter on the CALFED Draft Ecosystem Restoration Program Plan (ERPP), the Commission made a number of suggestions for high priority projects to enhance and restore habitat. This memo outlines more specific ideas for implementation of those recommended priorities. This memo has been prepared in partnership with representatives of the North, Central, and South Delta Water agencies, and represents ideas generally acceptable to those entities, and with the assistance of the Natural Heritage Institute. However, none of the Water Agencies have taken a formal position on the memo or the sites or ideas described in the memo. The Delta Protection Commission reviewed this memo at its July meeting and held a public meeting to allow discussion of the ideas in the memo. The Commission has not taken any action on the written report. The memo is subject to revision based on public input.

**CALFED ERPP HABITAT RESTORATION TARGETS FOR DELTA ECOLOGICAL ZONE:**

<b><u>Tidal:</u></b>	Tidal Perennial Aquatic	7,000 ac
	Shoal	500 ac
	Midchannel Islands	200 to 800 ac
	Fresh Emergent Wetland (tidal)	30,000 to 45,000 ac
<b><u>Nontidal:</u></b>	Nontidal Perennial Aquatic	500 ac
	(deep open water)	
	Nontidal Perennial Aquatic	2,100 ac
	(shallow open water)	
	Fresh Emergent Wetland (nontidal)	20,000 ac
	Seasonal Wetland Improve:	4,000 ac
	Restore:	30,000 ac
	Inland Dune Scrub	50 to 100 ac
	Perennial Grassland	4,000 to 6,000 ac
	Wildlife Friendly Agriculture	40,000 to 75,000 ac

## **DELTA PROTECTION COMMISSION COMMENTS ON DRAFT ERPP:**

The Delta Protection Commission comments regarding the Draft ERPP recommended that the ERPP be modified to prioritize the following restoration programs:

Restoration and/or enhancement of lands currently in public and/or nonprofit ownership (or currently in the acquisition process) and designated for restoration, such as Twitchell Island, Sherman Island, and Prospect Island. Approximately 35,000 acres fall in this category.

Acquisition and/or enhancement of currently flooded lands to create and/or enhance emergent habitat, such as Franks Tract, Big Break, Mildred Island, Little Mandeville, Island, etc. Approximately 7,000 acres fall in this category.

Protection, enhancement, and restoration of in-channel islands and waterside berms.

Development and implementation of management plans for upland areas already in public or nonprofit ownership, such as Calhoun Cut Ecological Preserve (approximately 1,000 acres), Rhode Island, etc.

Development and implementation of individual management plans for private agricultural properties and development of funds to offset costs of voluntary implementation of such plans (plans could include flooding programs, enhanced levees and pumps to enhance flooding and drainage, recommended crop rotation cycles, size and location of permanent brood ponds, etc.)

Development and implementation of individual management plans for privately-owned lands managed for wildlife habitat, such as duck clubs and upland hunting clubs, and development of funds to offset costs of voluntary implementation of such plans.

Control of stressors should be revised to avoid duplication with existing regulatory programs, such as existing dredging "windows", and the programs that are developed should respect the needs of existing land uses, such as water-oriented recreation. Where funds are needed to carry out specific programs, those funds should be made available to private land owners to implement CALFED programs.

**RECOMMENDED LIST OF SITES, BY TYPE OF HABITAT, TO BE EVALUATED  
FOR HABITAT CREATION/ENHANCEMENT:**

**Managed Wetlands (within levees):**

**GOAL of the Ad Hoc Group:** Prepare specific enhancement and management plans and obtain funding for restoration and management on lands already owned by public agencies or nonprofits before funding any additional retirement of privately-owned agricultural lands. Restoration and/or enhancement projects must be "good neighbors" and not result in adverse impacts to adjacent land or land uses.

**OPPORTUNITIES:**

Yolo Bypass Wetlands:	3,600 ac /DFG (project underway)
Sherman Island:	10,000 ac /DWR
Twitchell Island:	3,500 ac /DWR
Stone Lakes Wildlife Refuge:	1,090 ac /DPR
	1,000 ac /Sacramento County

[plus additional acquisition and management to complete the 9,000 ac northern half of the refuge]

Jepsen Prairie Preserve:	1,600 ac /Solano County Farmlands and Open Space Trust
Calhoun Cut:	970 ac /DFG
Tip of Grand Island:	250 ac /Corps of Engineers
Prospect Island:	1,200 ac /Bureau of Reclamation
Delta Cross Channel Lands:	100 ac /Bureau of Reclamation
Wright-Elmwood Mitgn. Bank:	80 ac /Private
Medford Island Mitign. Bank:	1,200 ac /Private
Private Duck Clubs	

**Enhancement of Existing Shallow Water Areas and Other Areas Outside Levees:**

**GOAL of the Ad Hoc Group:** Identify publicly and private-owned, water-covered sites that could be acquired, enhanced, and managed to provide improved shallow water habitat suitable for fish spawning and nursery areas. Identify other sites outside existing levees that could be enhanced for shallow water or other related habitats.

**OPPORTUNITIES SITES INCLUDE:**

Big Break:	800 ac /EBRPD
Browns Island:	600 ac /EBRPD
Franks Tract:	3,500 ac /DPR
Little Franks Tract:	330 ac /DPR
Mildred Island:	1,000 ac /Private
Little Mandeville Island:	375 ac /Private
Venice Tip:	160 ac /Port of Stockton

Tip of Prospect:	300 ac /Port of Sacramento
Decker: North Tip:	40 ac /DFG (Project proposal under review)
Decker: East Side:	140 ac /Port of Sacramento
Lower Sherman Island	
Wildlife Area:	3,100 ac /DFG
Delta Meadows:	134 ac /DPR
Little Holland Tract:	1,600 ac /Private
Kimball Island:	100 ac /Private
Rhode Island:	67 ac /DFG
Fern Island:	80 ac / Private
Little Hastings Tract:	125 ac / Private
Port of Stockton Lands such as:	
Browns Island:	100 ac
Donlon Island:	225 ac
Mandeville Tip:	176 ac
Venice Cut	211 ac
North Headreach:	53 ac
Tule Island:	36 ac
North Spud:	28 ac
South Spud:	60 ac
Acker Island:	7 ac
Webb Tract Berms and Islands:	285 ac /DFG
Sycamore Island:	13 ac /DFG
Acker Island:	25 ac /DFG
Cabin Slough Islands:	15 ac /DFG
Miner Slough Islands:	34 ac /DFG
Lost Slough Islands:	38 ac /DFG
Dow Wetlands	300 ac

#### **NATURAL HERITAGE INSTITUTE MAPS:**

To illustrate the location and extent of these lands, the Natural Heritage Institute (NHI) mapped the following areas on several maps:

1. **Public and Non-Profit Lands Currently Managed for Ecosystem Values in the Sacramento-San Joaquin Delta:** Public or non-profit-owned lands which are currently managed for ecosystem values including:

Yolo Bypass Wetlands Project, DFG and Yolo Basin Foundation  
Jepsen Prairie Preserve, Solano County Farmlands and Open Space Foundation  
Cosumnes Preserve, Nature Conservancy, Bureau of Reclamation and others  
Stone Lakes Wildlife Refuge Lands Under Management, U.S. Fish and Wildlife Service

Lower Sherman Island Wildlife Management Area, DFG  
White Slough Wildlife Area, DFG/DWR  
Woodbridge Ecological Preserve, DFG/DWR  
Eastern Half of Big Break, EBRPD

2. Private Lands with Conservation Easements or Mitigation Banks in the Sacramento-San Joaquin Delta: Privately-owned lands subject to conservation easements for wildlife values and lands in a mitigation bank including:

Duck Clubs in the Yolo Bypass  
Kimball Island Mitigation Bank  
Palm Tract Mitigation Site  
Medford Island Mitigation Bank  
Grupe Mitigation Bank  
Dow Wetlands Preserve (Antioch Shoreline)

3. Public Lands Not Actively Managed for Ecosystem Values in the Sacramento-San Joaquin Delta: Lands owned by federal agency, State agency, or local special district including:

Calhoun Cut (DFG)  
Various Lands Owned by Department of Water Resources in East Delta and near Rio Vista (Dredge Disposal Site)  
Various Lands Owned by the Port of Stockton  
Various Lands Owned by the Port of Sacramento  
Sherman and Twitchell Islands (DWR)  
Brannan Island State Park (DPR)  
Jersey Island (Ironhouse Sanitary District)  
Franks Tract (DPR)  
Little Franks Tract (DPR)  
Various Buffer Lands at the Sacramento Regional Wastewater Treatment Plant  
Browns Island (EBRPD)  
Various Lands Owned by the Navy (Solano County and San Joaquin County)  
Various Publicly-owned Lands in the Boundary of the Stone Lakes Wildlife Refuge without a Management Agreement (Sacramento County, Buffer Lands at the Sewage Treatment Plant and DPR)  
Various Lands Owned by DFG  
Tip of Grand Island, Corps  
Browns Island, EBRPD/SLC

4. **Opportunities for Ecosystem Protection and Restoration on Private Lands in the Sacramento-San Joaquin Delta:**

Lands Subject for Flowage Easements in the Yolo Bypass

Lands in Boundary of Stone Lakes Wildlife Refuge Boundary: North of Lambert Road, willing seller only; South of Lambert Road, willing signatory to agricultural management agreement only.

McCormack-Williamson Tract, sale in progress to Nature Conservancy

Water-Covered Lands East of Locke, on list of possible acquisitions by DPR

Montezuma Project: Proposal to fill privately-owned lands with dredged material and restore to tidal action is currently under review.

Winter Island: Privately-Owned Duck Club seeking improved water control structures.

Delta Wetlands Project: Proposal to Manage Bouldin and Portions of Holland Tract as managed wetland-agriculture mosaic is currently under review

Mildred Island: Privately-owned flooded island

Little Mandeville Island: Privately-owned flooded island

Fern and Headreach Islands: Enhancement project/mitigation bank project being proposed

By mapping the above-listed sites, NHI was able to develop a map which illustrates Ecosystem Management and Restoration Opportunities in the Sacramento-San Joaquin Delta. See attached composite map showing areas currently under management and opportunity sites.

**ENHANCEMENT OF RIPARIAN CORRIDORS:**

One of the key concepts of CALFED's ERPP is restoration and enhancement of Delta riparian corridors. This memo describes alternative concepts for enhancement of three key riparian corridors consistent with the need to maintain and enhance the flood control and water conveyance functions of the major tributaries to the Delta.

The CALFED program has identified the need for riparian habitat enhancement to improve migratory corridors for anadromous fish, such as salmon, and spawning habitat for those fish species that spawn in the Delta environment, such as Delta smelt. In addition, the riparian habitat corridors provide habitat for birds, mammals, insects, reptiles, amphibians, and indigenous plants.

**Sacramento River Corridor Enhancement:**

Currently the Sacramento River corridor is bounded by large, project levees which are largely unvegetated. The Sacramento Deep Water Ship Channel is closed off from the Sacramento River at the north end with a lock structure. The several sloughs between the Sacramento River and the Yolo Bypass are within project levees (Steamboat, Elk and Miner Sloughs; Oxford Slough (aka Duck Slough) is unleveed and now functions as part of the irrigation water system for RD 999).

The ERPP recommends enhancing riparian corridors (page 27, March 1998) along several smaller sloughs and waterways between the Sacramento River and the Deep Water Ship Channel to the west, such as Steamboat, Miner, Oxford, and Elk Sloughs. Enhancement would include setback levees and riparian habitat enhancement. Within the Yolo Bypass, channels would be constructed to connect to channels in the Yolo Basin (i.e. connections to Putah and Cache Creeks, Colusa Drain, and Sacramento River via Sacramento and Fremont Weirs), constructed as permanent sloughs along either side of the Bypass. The ERPP suggests the lock at the north end of the Sacramento Deep Water Ship Channel be mitigated through construction of fish passage facilities. Habitat enhancement is proposed on the Sacramento River from Sacramento to Rio Vista.

CALFED should consider possible enlargement and enhancement of a corridor within the Yolo Bypass which incorporates the existing "Toe Drain" to the west of the Deep Water Ship Channel. This corridor should connect to the main stem of the Sacramento River at either or both the Sutter Weir or the Sacramento Weir. The Toe Drain is largely unvegetated but lies within the Yolo Bypass, where the lands are already subject to flood easements purchased to provide flood protection to the City of Sacramento and the Delta area. While the Sacramento River can contain flows of about 150,000 cfs, the Yolo Bypass can contain about 450,000 cfs. Locating an enhanced riparian corridor within the Yolo Bypass would also address the identified issues of stranding of fish within the Yolo Bypass at the end of the flood season. Creation of an enlarged, excavated channel would enhance flood water carrying capacity of the Yolo Bypass, which would then allow introduction and maintenance of beneficial riparian plant material into portions of the floodway.

#### **Mokelumne/Cosumnes Corridor:**

The Mokelumne/Cosumnes Corridor must serve multiple purposes: water conveyance through the Delta in Alternative Two, flood control for Sacramento and San Joaquin County, and a riparian habitat corridor for aquatic and terrestrial species. CALFED's flood control, water supply and ecosystem restoration elements must be carefully balanced to consider the overall effects of their action on the other uses. At the same time, care must be taken with design of a flood control plan that the plan be comprehensive and not simply a transfer of the risk to another island. Ecosystem restoration effects on the South Fork of the Mokelumne should provide a flood benefit, or at a minimum be flood neutral.

**Corridor Enhancement** The Cosumnes River is basically undammed and flows from the foothills to the Delta, meeting the Mokelumne River at the eastern edge of the Legal Delta. The Cosumnes Preserve, a multi-agency, public-private project, has been acquiring lands along the Cosumnes River for the last decade and has proposed management changes to enhance seasonal flooding along portions of the waterway and restore riparian habitat.

The Mokelumne River is dammed twice upstream of the Delta to provide water for export to the East Bay (Pardee and Comanche Reservoirs). Downstream of McCormack Williamson Tract (Bean Ranch), the Mokelumne River splits into the North Fork, which lies between Tyler and Staten Islands, and the South Fork, which lies between Staten Island and New Hope Tract, Brack Tract, Canal Ranch, and Terminous. At the south end of Staten Island, the South Fork turns toward the west and rejoins the North Fork at the south end of Tyler Island, near Bouldin Island and Highway 12. The South Fork has been the subject of several projects on Staten Island to recreate berms at the waterside toe of the levees. At the south end of Staten Island, several in-channel islands have been protected with riprap and bolstered with placement of earthen material. Along the North Fork on the shoreline of Tyler Island, a project is underway to protect and enhance riparian vegetation on the waterside berms and at the toe of the levees.

The CALFED ERPP vision for the Cosumnes and Mokelumne upstream of the Delta (March 1998), Eastside Delta Tributaries, includes restoration of floodplains, seasonally flooded habitat, tidal wetlands, splittail and chinook salmon rearing habitat, sandhill crane habitat, and a riparian plant community for the Cosumnes. The vision for the Mokelumne is to support self-sustaining fall-run chinook salmon and steelhead populations by improving stream flows, gravel recruitment, floodplain configuration, fish passage, salmon spawning and rearing habitat, riparian habitat, screening of diversions, and enforcement of fishing regulations. The CALFED ERPP vision for the East Delta (March 1998), which starts two miles east of the confluence of the Cosumnes and the Mokelumne Rivers, recommends "extensive restoration of native Delta habitats" for the lands "along the South Mokelumne River and its adjoining dead-end sloughs (Beaver, Hog, Sycamore)". Currently proposals focus on flooding farmed lands on Brack Tract (5,000 ac) and Canal Ranch (3,000 ac). The subsided land would be converted to floodplain overflow basins with permanent non-tidal wetlands (1,000 ac), or seasonal agricultural production. When the land area elevations increase in the future, these areas could be opened to tidal action. Higher elevation lands would be permanently flooded (1,000 ac), thereby eliminating some of the most productive and stable farmland in the Delta.

As an alternative, CALFED should work to develop an integrated plan for the Mokelumne River which addresses flood control, water conveyance, and habitat values. The process should start with a flood control plan for both forks of the River, including controlled flooding of McCormack Williamson Tract in a way which eliminates the surge caused by flood water from upstream flooding of the Tract breaking through downstream levees. There are major constrictions in the upper reaches of the South Fork near New Hope Landing which currently limit the conveyance capacity of the South Fork. The plan should work with plans being developed for the upper Cosumnes River and should include new areas of floodway in the Cosumnes Preserve.

The water conveyance system for Alternative Two currently includes closing the Delta Cross Channel Gates (maximum flow of 6,230 cfs) and transporting up to 10,000 cfs through a new isolated channel from Hood to the Lost Slough and Mokelumne River east of McCormack Williamson Tract. Any designs of channel enlargement needs to address both flood flows and "through Delta" water transfer flows.

Various alternative scenarios to address flood flows in the North Delta area being evaluated by CALFED. These alternatives include various combinations of dredging and setback levees. To ensure a continuous riparian corridor in this region, alternatives on the South Fork should ensure that vegetated berms and in-channels islands are protected, that surface elevations of waters in the South Fork are not increased, and that velocity is maintained. Increase in surface elevation could "drown" the existing vegetation, and increased velocity could result in enhanced erosion of in-channel islands and berm areas on the water-side toe of levees. Dredging within the South Fork, in compliance with these conditions, would result in increased flood water transport, increased water conveyance, enhanced habitat for Mokelumne River salmon, and positive impacts on bromide and other salts at the export pumps.

Once a coherent flood control and water conveyance plan for the Mokelumne/Cosummes Corridor is conceived, a robust habitat enhancement scenario should be overlain on the plan. In the past few years the Cosummes Preserve has increased in acreage, creating a strong riparian corridor along the lower Cosummes River. This corridor connects to riparian vegetation along the South Fork of the Mokelumne which has also been the subject of several enhancement and protection projects. Increasing channel capacities through dredging would generate material for both levee strengthening and new habitat creation--wetlands or berms. Controlled flooding of McCormack Williamson Tract would provide significant opportunities for habitat enhancement.

#### **San Joaquin River Corridor:**

The San Joaquin River is channelized, with newly enhanced levees along urban development in the South Stockton area.

The ERPP recommends restoration of floodplain habitat along the lower San Joaquin River between Mossdale and Stockton with levee setbacks and overflow basins, and improved riparian habitat along leveed sloughs. The ERPP includes installation of a barrier at the head of Old River to keep migratory fish in the main stem of the San Joaquin River. The purpose of the enhancement of the San Joaquin River are joint benefits associated with flood water transport and enhancement of fisheries migration corridors.

The Head of Old River Barrier (Barrier) cannot be installed without also installing the tidal barriers per the Interim South Delta Plan in order to mitigate the downstream impact of the Barrier. The Barrier can only be operated in the Spring during the 31-day April/May pulse flow when exports and local diversions are low. Allegedly 35% of the San Joaquin smolt migration occurs before and after the pulse flow. These smolts can be largely protected by operation of the three tidal barriers throughout the migration period to create an hydraulic barrier at the bifurcation of Old River from the San Joaquin River.

Currently, south of Mossdale to the San Joaquin County boundary, the San Joaquin River provides multiple opportunities to enhance riparian vegetation. For most months of most years, flows in these reaches of the San Joaquin River do not exceed 3,000 cfs. Aside from the channel,

land in and adjacent to the floodway along this reach is above sea level and cannot be converted to wetlands. The low-flow channel could be established generally near the west or left bank of the existing levee system which, once stabilized and bermed, could support nearly continuous areas of large riparian vegetation to shade the low flow channel. Oxbows and bends currently cut off from the river flows could be re-opened and maintained providing feeding and resting areas for aquatic species. Continuing channel maintenance is needed to prevent aggradation of the low flow channel and the access to bends and oxbows.

North of Mossdale to Stockton, the main stem of the San Joaquin could continue to be enhanced for seasonal migratory fish passage through the release of pulse flows necessary to stimulate inland migration, and enhance seaward migration.

Enhancement of riparian vegetation corridors could proceed on two other waterways: Paradise Cut to Old River to Grant Line Canal to Old River, and Old River to Middle River to San Joaquin River. Paradise Cut is a flood control channel designed to carry 15,000 cfs, which has not been maintained. To improve Paradise Cut, the weir to Paradise Cut could be enlarged, the Cut could be enlarged by incorporating mitigation lands east of the Cut to be provided by the Gold Rush City project (900 acres) and by clearing and dredging the connection to Grant Line Canal. Grant Line Canal connects to Old River, a waterway with numerous in-channel islands suitable for management and enhancement. The result could be flood flow capacity enlarged and maintained to 20,000 cfs at "design" Vernalis flood flows, and a riparian corridor suitable for avian and terrestrial species. Middle River leaves the main stem of the San Joaquin north of Stewart Tract, flows north between Union and Roberts Islands, and rejoins the San Joaquin River between Medford and Mandeville Islands. The portions of this waterway between Roberts and Union Islands should be cleared of brush and sediments to increase flood flow capacity and the levees should be improved and perhaps set back in constricted locations to accommodate the planting of trees that will not adversely affect flood flows and will provide habitat for avian and terrestrial species.

#### **WILDLIFE FRIENDLY FARMING PRACTICES PROGRAM:**

A wildlife friendly farming practices program, or farm stewardship program, should integrate management for the many species of wildlife that use agricultural land for habitat. Clearly migratory waterfowl make up a large proportion of that wildlife, but there are many other birds, mammals, reptiles, amphibians, etc. that should be addressed.

Several recent documents have been prepared and released which outline general concepts associated with wildlife friendly agriculture. In 1994, Ducks Unlimited released a pamphlet titled "Managing Delta Farmlands for Wintering Waterbirds". The pamphlet includes nine recommendations to improve managing Delta farmlands for wintering waterbirds including: Preferred Crops, Minimal Tillage, Sequential Flooding, Shallow Flooding, Early and Late Water, Most Soils Plant Production in Wheat Fields, Permanent Levees, Sanctuaries, and Field Monitoring. In 1997, Department of Fish and Game released a report entitled "Farming for

Wildlife: Voluntary Practices for Attracting Wildlife to Your Farm". The report includes sections on: Managing Crop Lands; Using Fallowed Fields; Taking Advantage of Non-Farmed Areas; and Making the Most of Water. Each chapter includes information and farmer profiles, and the report lists contacts for more information and assistance.

Site specific wildlife-friendly agriculture management plans can be developed for a variety of purposes. Sanctuaries can be provided during the periods when duck clubs are being hunted. Early application and late retention of water provides habitat for early and late avian migrants. Water application must be designed and managed to ensure that water stays "fresh", and does not encourage mosquito breeding or other public health problems. Mudflats and deep ponds provide habitats that serve needs of avian species such as shore birds and swans. Water features can be designed and located to enhance nesting activity. Spring feeding needs of geese, swans and cranes can be addressed on new wheat or other green vegetation promoted through flash flooding of fallow fields. Consideration should be given to provision of corridors and refugia for young of the year. Checkerboard cropping, also called mosaic, will create a variety of year round habitats. Many crops provide food for wildlife, and weeds also provide seeds which are valuable food source. Grazing lands should be managed to protect ground nesting species. Predators should be identified and controlled as necessary. Key habitat areas should be protected from intrusion by humans; many types of human activity can impact wildlife activities. Based on the demonstration project described below, many years of previous and subsequent experiences with post-harvest flooding of agricultural lands in the Delta, and intuition, wildlife friendly agricultural practices programs should be formulated and implemented.

The following is a description of a sample project which was developed by landowners and Department of Fish and Game staff in 1993-1994 for waterfowl purposes. The project is associated with duck hunting, although it is located in the Central Delta, an extensive agricultural area. This Crop Shift Demonstration Project was conducted on Rindge Tract in the Central Delta. The Department of Fish and Game recommended certain measures to mitigate any impacts to bird life from the demonstration project. Most of those measures were implemented as a part of the demonstration project, and the results were monitored and positive results were reported.

#### Objectives:

1. Extend availability of post-harvest flooded grain fields to cover full period of usage by migratory birds.
2. Enhance food value of post-harvest flooded grain fields by intentionally leaving more grain in the fields by either modifying harvest practices or intentionally not harvesting portions of the fields to be flooded.
3. Create fringe areas during important periods to enhance forage opportunities for certain species (e.g. Sandhill cranes, Swainsons hawks).

4. Extend availability of programs across the Delta lands utilized by important migratory speicies to discourage over-concentration in one area.
5. Avoid interference with existing agricultural economy of the region.

**Program:**

1. Voluntary participation.
2. Include a combination of early-harvested and late-harvested small grain crops to increase time availability of post-harvest flooded habitat.
3. Participants would agree to leave small percentages (5 to 10%) of crop unharvested in small plots in participating fields distributed across area to be flooded.
4. Harvest specifications:
  - A. Wheat/Barley stubble 12 inches or less in height; not disced prior to flooding.
  - B. Corn stubble 24 inches or less in height; can be single-disced prior to flooding.
5. Flooding specifications:
  - A. Wheat/Barley flooded as soon as practicable after September 15th.
  - B. Corn fields flooded as soon as practicable after harvest and left flooded until at least January 15th (include appropriate water circulation).
  - C. Where practicable, some marginal area of flooded fields to be left dry or shallowly flooded for raptor, crane, and shorebird foraging during flood-up.
6. Compensation. Payment for additional costs incurred and revenues foregone would be based on a dual scale:
  - A. A payment to the entity incurring the additional drainage cost would be made for additional drainage costs resulting from increased drainage caused by the program (estimated to be approximately \$15.00 per flooded acre).
  - B. An additional payment would be made to the farming entity for unharvested acreage based on the value of the unharvested crop less harvest, drying (if any), hauling, and other similar costs not otherwise incurred (estimated to be approximately \$100/ton of crop not harvested, or \$20 to \$40 per acre for participating acreage, depending on percentage of crop not harvested).